U.S. DEPARTMENT OF ENERGY OFFICE OF SCIENCE

OFFICE OF ADVANCED SCIENTIFIC COMPUTING RESEARCH • OFFICE OF BIOLOGICAL AND ENVIRONMENTAL RESEARCH

GENOMES to LIFE

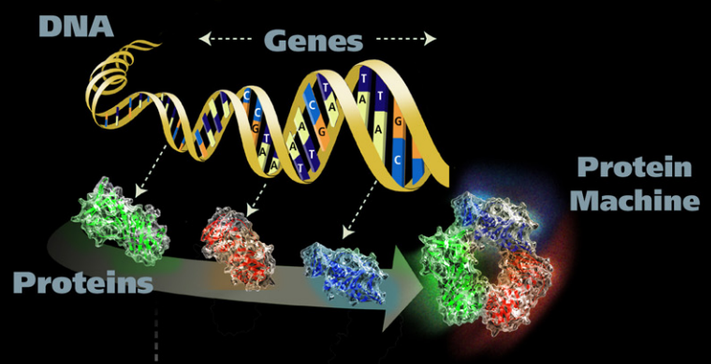
Human Genome Program • Microbial Genome Program • Genomes to Life Program

DOEgenomes.org

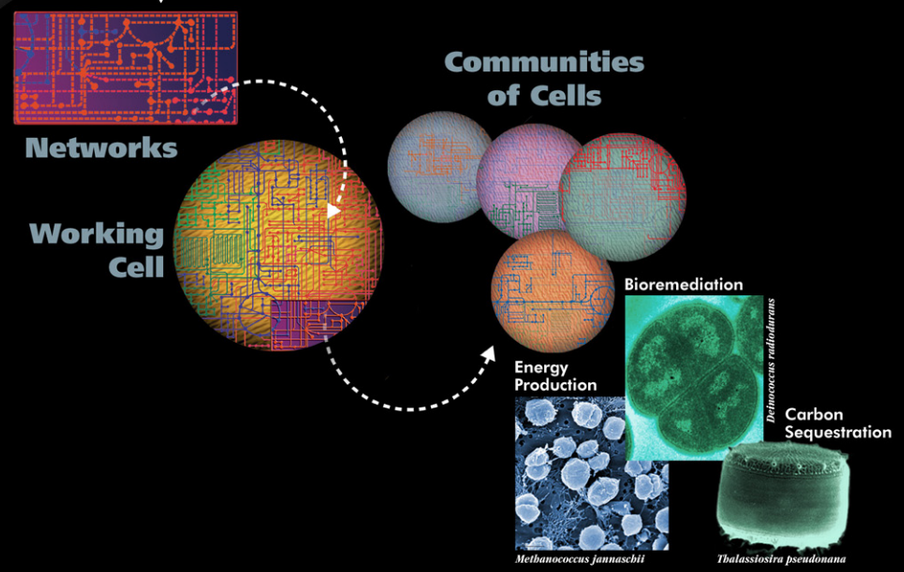
GENOMES to LIFE
BIOLOGICAL SOLUTIONS FOR ENERGY CHALLENGES
U.S. DEPARTMENT OF ENERGY
INNOVATIVE APPROACHES ALONG UNCONVENTIONAL PATHS

Office of Science
U.S. DEPARTMENT OF ENERGY

Understanding the Fundamental Processes of Complex Living Systems



from **Sequences** to **Systems**



Using Microbes for DOE Missions

Exploring Systems Biology

A comprehensive understanding of cellular processes in a realistic context

Genomes to Life Scientific Goals

- Identify and characterize multimolecular machines performing life functions
- Characterize gene regulatory networks and pathways controlling cellular processes
- Characterize diverse functional abilities in natural microbial communities
- Develop new computational capabilities for modeling complex living systems

from **Genomes** to **Life**

Accelerating the Pace of Discovery

A plan by BER and OASCR to develop complementary, large-scale user facilities accessible to the life sciences community

User Facilities for Systems Biology

- Production and Characterization of Proteins
- Whole Proteome Analysis
- Characterization and Imaging of Molecular Machines
- Analysis and Modeling of Cellular Systems

Genomes to Life Hallmarks

- Microbial genomics
- Advanced technologies
- High-throughput analysis and production
- Informatics and databases
- Computing and simulation
- Biosystems training and technology transfer

Serving DOE Missions

Help enable U.S. energy security • Stabilize atmospheric carbon dioxide to counter global warming • Save billions of dollars in toxic waste cleanup and disposal

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